Virginia Gardening

with Jim May

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Don't Treat Your Soil like Dirt
Healthy soil is critical to any type of gardening
By Jim May

Master gardeners, nursery operators, farmers and successful gardeners everywhere will tell you how important good soil is to growing healthy plants. Whether it is garden seedlings, farm crops, bulbs, perennials, turf or shrubs and trees, our soil and how we treat it is critical to their success. Too often, soil is treated like dirt and taken for granted. Soil is not just something to support or prop up plants; it is a living system that is essential to plant life.

It takes thousands of years for rock to develop into soil, and hundreds of years for rich organic layers to build up from decaying leaves and other plant materials. Soil is made of air, water, mineral particles, organic matter, and organisms. Half of soil is pore space. Generally, pores are about half filled with water and half air, although that can vary greatly depending on weather, plant water use, and soil texture. Most of the solid portion of soil is mineral particles. Organic matter may make up only a small portion (less than 5% of the weight), but it is critical in holding soil particles together, storing nutrients, and feeding soil organisms.

Organic matter like manure and compost can be difficult to obtain in large quantities in some areas. Not everyone has a horse, or even an actively working compost pile. However, other sources such as fall leaves or "green manure" crops are available to just about everyone. Tilling leaves into the garden in the fall or planting rye or buckwheat cover crops can be very beneficial. For smaller areas, manures and other soil conditioners are available by the bag at your local garden center. Any way you can do it, adding organic matter is helpful.

Think of soil as a living system. Bacteria, fungi, nematodes and other microbes in the soil feed the insects and earthworms that live there. Earthworms enhance the soil structure when they burrow through and deposit fecal pellets that become stable soil aggregates. All of this increased activity only serves to make soil healthier. Physical and chemical processes are also important to the formation of soil aggregates - especially the smaller aggregates. Particles are physically pushed closer together by freezing and thawing, wetting and drying, and roots pushing through the soil.

The regular addition of organic matter does many things for the soil, including increasing the soil's ability to hold water and nutrients. It could very well be another dry summer in Virginia and your soil's water-holding ability will be critical, especially to newly planted plants.

Nutrient availability to plant roots is also dependent on soil moisture. Nutrients are dissolved in a thin layer of water, or "soil solution" that surrounds each particle of soil. As plant roots travel through the soil, they absorb these dissolved nutrients. In dry soil, nutrients don't dissolve and are not available.

Remember that healthy, rapidly growing plants are less likely to be targets for insects and disease. These predators prefer to attack weak, unhealthy plants first. If they can get a foothold with the unhealthy plants, the rest of the garden may be in danger, so don't even give them a chance to start.

Organic matter increases the water-holding capacity of sandy soils by acting as tiny sponges. Humus – the stable portion of organic matter – acts like a glue to hold soil particles together. In areas of the state where the soil tends to be high in clay content, humus helps to clump microscopic clay particles together into larger aggregates, thus opening up pore spaces for air and water movement.

Water drainage in soil is extremely important. When you read in gardening publications terms such as "plant in any well-drained soil" or "does not like wet feet", they're talking about the plant's need for air. Plant roots need oxygen and any soil that is waterlogged will be lacking in oxygen. Although many plants will tolerate high soil moisture conditions for a short time, extended periods may kill them. Improving drainage is another factor critical to plant growth.

Soil compaction is a problem in most soils, from home gardens to farm fields. Soil can become compacted by tractors and other equipment or just by tilling it to the same depth year after year. Tilling soil when it is too wet can have a detrimental effect also. It ruins the structure of the soil and can take a long time to repair. Squeeze a handful of soil. If it crumbles apart it's ready to till. If it stays clumped together, it's still too wet.

You should test your soil every couple of years for nutrient levels, pH and organic matter content. Soil test forms and boxes can be obtained from your local Virginia Cooperative Extension office, or there are test kits available for purchase at local garden centers. Remember that successful gardening starts from the ground up and soil that is treated well will reward you with healthier plants less prone to disease and insect damage.

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